ABSTRACT

A data transmission system is provided for transmitting user data to and receiving data from a communication channel, comprising a parity check matrix having M tiers, wherein $M \geq 2$, Dmin = 2 * M for M=1..3 or $2*M \geq Dmin \geq 6$ for M > 3, wherein Dmin

5   is the minimum Hamming distance, c=M, wherein tc is the column weight, and cycle-4=0. A linear block encoder encodes the user data in response to the parity check matrix, and a transmitter transmits an output of the linear block encoder to the communication channel. A soft channel decoder decodes data, and a soft linear block code decoder to decode data decoded by the soft channel decoder in response to the

10   parity check matrix.